PROJECT NUMBER: 4009
PROJECT TITLE: Development Smoke Studies
PROJECT LEADER: B. L. Goodman
PERIOD COVERED: November, 1989

I. REDUCED SIDESTREAM CIGARETTES:

A. Objective: Develop subjectively acceptable cigarettes with reduced sidestream visibility.

B. Status:

Trim V: Three new inner liners from Papeteries de Mauduit were evaluated in 19.5 mm circumference models. The new papers were all less porous than the inner liner used on Superslims, and one contained 4% mono-potassium phosphate. They all achieved comparable visibility reductions at about 75%. Another set of 19.5 mm circumference cigarettes were smoked subjectively. The control double-wrap model was compared to one with phosphate on the outer wrap and one with phosphate on the inner liner. All models were considered different but acceptable, and they all gave visibility reductions of 75-78%.

Lotus: A meeting was held with representatives from Kimberly-Clark to discuss optimizing the heavy basis weight paper currently in use for development of Lotus. A matrix of papers was subsequently provided that consisted of samples containing 26 and 36% $CaCO_3$, each at 2.9 and 4.2 Coresta. Chemical Research provided target levels of KH_2PO_4 for each paper to achieve the desired visibility reductions for each paper. The papers were sized with the appropriate levels of additive for cigarette production.

Cigarettes made with varying ratios of potassium and phosphorous on the high basis weight paper showed increasing visibility reduction as the level of phosphorous increased, primarily due to a decrease in burn rate. A model with a low level of phosphoric acid was not subjectively different from the control containing 10% potassium phosphate. The control model, at tar delivery level of 8 mg, was put on the MC panel for subjective evaluation.

Cigarettes were made with three different $Mg(OH)_2$ papers from Ecusta, each with different burn additives, and each perforated and unperforated. The sidestream visibility reduction ranged from about 65% to about 75%, but the ash quality was typically poor for $Mg(OH)_2$ papers.

Ambrosia: Work has continued on including Aromatek-245 on the 73 g/M paper. Cigarettes with Aromatek-245 have been made in 24.8 mm circumference with the K-C heavy paper, in a double-wrap configuration, and using succinate as the fluxing agent; models were made with Marlboro filler and the new low sidestream blend. Several models have been evaluated subjectively. Sidestream

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visibility was reduced by 65% for all of the models except one with a phosphate double-wrap, which gave higher reduction.

C. **Plans**: Continue evaluating the effectiveness of different fluxing agents at varying levels.

Continue evaluating cigarettes with Aromatek-245.

Initiate development of a Marlboro-type cigarette with 40-50% visibility reduction.

Evaluate a new aftercut provided by Flavor Development for Lotus.

II. SIDESTREAM VISIBILITY MEASUREMENTS

A. **Objective**: Determine sidestream visibility of experimental cigarettes and commercial brands.

B. **Status**:

Sidestream Visibility Measurements: An experimental cigarette made with an overall calendered paper was compared to the control uncalendered 15 Coresta paper. There was a 30% reduction due to the calendering process. Static burn time increased by 20%.

C. **Plans**: Continue to test experimental low sidestream models.

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